

REMARKS

Claims 1-4 and 6-8 have been rejected by the Examiner under 35 U.S.C. § 102(b) as being anticipated by Daute, Peter (Uphues et al., US 5,442,082) or Hamaguchi, Koji (Miyachi et al., US 5,801,135), or Irinatsu, Yuichi et al. (US 6,179,957) or Hamaguchi, Koji (Hamaguchi et al., US Patent 4,964,949) or Irinatsu, Yuichi et al. (Irinatsu et al., US 6,103,056) or Ikeda, Yasushi (Ikeda et al., US 6,565,708) or Hamaguchi, Koji (Takahashi et al., US 5,672,244). Also, claims 1-4 and 6-8 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Ikeda, Yasushi, (Tadokoro et al., US 6,599,392). These rejections are respectfully traversed.

The present invention is directed to a deinking agent represented by the general formula (Y) with its hydroxyl value (OHV), its saponification value (SV) and its acid value (AV) satisfying the relationship $OHV/(SV - AV + OHV)$ which falls within the range of 0 to 0.5. Thus, the Applicants have defined a particular relationship which is effective in improving the ink collective power of the compounds identified by formula (Y). As noted on page 9 of the present application, the closer to zero the value of $OHV/(SV - AV + OHV)$ becomes, the better improved is the compound (Y) in its collecting power of ink. Also, the foaming property in the step of flotation is decreased so that the yield is improved. On the other hand, the larger the value of $OHV/(SV - AV + OHV)$ is from zero, the more increased foaming property the compound possesses whereby the yield rate of pulp is decreased.

As noted on page 10 of the present application, when an alkylene oxide is added to a mixture of a polyhydric alcohol with fats and/or oils, polyalkylene oxide adducts including no polyhydric alcohol is produced as a byproduct at the time of esterification or addition of the alkylene oxide. This byproduct is poor in deinking. On the other hand, when esterifying an alkylene oxide adduct to a polyhydric alcohol having 3 to 10 valences, which is not mixed with fats and/or oils as the raw material for esterification, little polyalkylene oxide adducts including no polyhydric alcohol is produced. Because of the limitation in the formation of byproducts, the deinking ability of the compound is enhanced. Advantageously, the deinking agent or compound is prepared by esterifying the alkylene adduct to a polyhydric alcohol having 3 to 10 valences with a carboxylic acid at a temperature of 100°C to 260°C. Thus, in the deinking agent produced

by the process of claim 1, as amended, fats and/or oils do not form part of the reaction mixture and accordingly, no polyalkylene oxide compound is produced. Please see again in this regard the descriptions set forth on page 10, lines 13-20 in the present application. Thus, as a value of $\text{OHV}/(\text{SV} - \text{AV} + \text{OHV})$ becomes smaller, the deinking ability becomes more excellent, even when $\text{OHV}/(\text{SV} - \text{AV} + \text{OHV})$ falls within the range of zero to 0.5.

On the other hand, when the content of the byproducts as a result of side reactions becomes larger, the deinking ability becomes increasingly worse. As stated above, the polyvalent alcohol and the side-products are produced when an alkylene oxide is added to a mixture of the polyhydric alcohol with fats and/or oils. In such a situation, when the content of the side-products becomes larger, the value of $\text{OHV}/(\text{SV} - \text{AV} + \text{OHV})$ becomes disadvantageously larger. Please see in this regard the description found on page 10, lines 1-12 of the present application.

None of the references relied upon by the Examiner recognize the desirability of eliminating the presence of fats and/or oils which is directly related to the relationship $\text{OHV}/(\text{SV} - \text{AV} + \text{OHV})$ falling within the range of 0 to 0.5 as defined in claim 1 of the present application.

Thus, the Dante (Uphues et al.) reference, US 5,442,082 in column 3, lines 12-15, discloses the use of fats and/or oils in the esterification process. In this regard, please also note Examples 1, 2 and 3 wherein soybean oil is used in the reaction process.

In the Hamaguchi (Miyachi et al.) reference, US 5,801,135, a deinking composition is disclosed wherein in the reaction process, a mixture of polyvalent alcohol and fats and/or oils are utilized, please see column 3, lines 32-35 of the reference patent.

In the Hamaguchi et al. reference (US 4,964,949), column 2, lines 1-5, discloses a deinking composition which comprises a reaction product obtained by adding one or more alkylene oxides to a mixture of a natural oil or fat and a polyhydric alcohol.

The Ikeda et al. reference (Tadokoro et al. US 6,599,392), is directed to a paper bulking promoter wherein sheets of paper obtained from a pulp feedstock can be made bulky without reducing the effect of a sizing agent. The ester compound of the paper bulking promoter shows in column 1, lines 60-63, that alkylene oxide adducts to an ester of polyvalent alcohol and fatty

acid is obtained. Thus, a known esterification and a known alkylene oxide addition reaction are utilized. There is no description in this reference patent that the esterification is carried out after the addition of the alkylene oxide to the alcohol.

The Irinatsu et al. reference, US 6,179,957, discloses a deinking method for deinking waste paper such as newspapers, leaflets, magazines and the like. In the reaction process, a non-ionic surfactant, which is utilized in the reaction process, is an alkylene oxide adduct of a mixture of an oil and fat and a mono- or polyhydric alcohol. (Please see column 4, lines 52-56 of the reference patent.) Similarly, the Irinatsu et al. reference, US 6,103,056, discloses a method for controlling deinking flotation wherein the non-ionic surfactant which is utilized is an alkylene oxide adduct of a mixture of an oil and fat and a mono- or polyhydric alcohol. (Please see column 5, lines 12-15 of the reference patent.)

Finally, with respect to the Hamaguchi, Koji reference (US Patent 5,672,244), the Examiner acknowledges on page 12, last paragraph of the Office Action letter, a deinking method wherein the deinking agent comprises a reaction product of an alkylene oxide adduct of an oil or fat.

Because none of the references relied upon by the Examiner as discussed hereinabove recognize the Applicants' inventive contribution, it is believed that the rejection of the claims as being anticipated by the various references relied upon by the Examiner are untenable and thus reconsideration of the rejections and allowance of all the claims of the present application are respectfully requested.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

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Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Joseph A. Kolasch, Reg. No. 22,463 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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